Discussion of

"Optimal Fiscal and Monetary Policy in a Medium-Scale Macroeconomic Model"

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Contribution:

Characterize optimal fiscal and monetary policy in medium scale business cycle model of US economy

- Medium scale model
  - – Christiano, Eichenbaum, Evans (2005), Smets and Wouters (2004)
  - – Frictions: sticky prices, wages, demand for money by households, CIA constraint for firms, invest. adj. costs, variable capital utilization, habit formation, imperfect competition on labor and goods markets
  - – 3 Shocks: productivity (TFP), govt. expenditure, government transfers
  - – Policy tools: tax rates, interest rate
- Calibrated
- Ramsey equilibrium (timeless perspective)
  - – Steady-state: optimal steady-state tax rates, inflation
  - – Dynamics: variability of tax rates, inflation
- Implemented with simple optimized policy rules
  - – Novel technique: simple rules based on minimizng distance between IRFs
- Misc. topics: Time to tax, volatility of capital taxation

Why is it important?

- Numerous studies on optimal monetary policy
- Few on interactions of monetary policy and fiscal policy
  [Lucas, Stokey (1983), Chari Christiano Kehoe (1995), Benigno Woodford (2004), SU(2004a, 2004b, 2005)]
  – all in very stylized environments (few frictions)
- Need to consider richer/quatitative model to assess effect of various frictions, and interactions between frictions
- Crucial that we know optimal steady-state inflation, tax rates
- Potential critique: Not feasible to conduct stabilization fiscal policy at quarterly freq. (given existing institutions)
  - But still useful to know what would an optimal fiscal policy look like: May be (far) in future governments will consider fiscal rules as guides

Key Findings

- Price stability: central goal of optimal monetary policy
  - Optimal inflation rate: $\pi^* = 0.5\%$ with std. dev. of 1.1%
    even though model contains non-state contingent public debt, no lump-sum taxes, sticky wages

- Simple policy rules can replicate well Ramsey equilibrium

- Optimal fiscal policy:
  - Income tax regime (same rates): optimal tax rate stable around 30%
  - Different labor/capital tax rates: large and volatile subsidy on capital

Some Issues:

1. Calibration and senstitivity of results

2. Intuition underlying $\pi^* > 0$

3. Derivation of simple optimal rules
   - Potential pitfalls of the method proposed
   - Problems of simple rules

4. Implementation of optimal policy

1. Calibration and sensitivity of results

- Calibration:
  - – Some parameters fixed, or from ACEL (2004), or Mendoza, Razin, Tesar (1994)
  - – Some estimated by CEE: price elast. of demand, Calvo param. (based on full inflation indexing $\chi = 1$)
  - – But use $\chi = 0$ (from Cogley Sbordone, 2004): Inconsistent!!!
  - – Processes for gov. expenditure, transfers: Estimated using HP filtered data
  - – Productivity shock: residual needs to fit postwar properties

- No reason to believe that parameters are mutually consistent
  – Productivity shock picks up mistakes
- Contribution of paper: quantitative assessment of various frictions and implications for optimal policy:
  – Need to estimate model ! (min. distance or Bayesian...)

1. Calibration and sensitivity of results (cont.)

- Inflation indexing, process for transfers most likely distorted
- Does it matter? Yes!

Infl. Indexing	Avg. transfers	π^* (in %)	R^* (in %)
0	7%	0.2	4.2
1	7%	4.6	8.8
1	0	-3.8	0
0	0	-0.2	3.8

Table 2: Ramsey Steady States (p. 27)

π^* sensitive to inflation indexing and size of transfers

2. Intuition underlying $\pi^* > 0$

- Main finding: $\pi^* \approx 0.5\%$ with std. dev. of 1.1%
  - Appears reasonable, intuitive
  - Comforting for central banks

- Result from interplay of several distorsions:
  - Money demand (Friedman rule): $\pi^* < 0$
  - Price rigidities (price dispersion): $\pi^* = 0$
  - Net transfers (pure rents) not taxed: Govt.'s incentive is $\pi^* > 0$!

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- When tax rates can be differentiated, only motive for having $\pi^* > 0$: reduce transfers. Not intuitive!
  - Why not tax transfers? Would mitigate distorsions caused by $\pi > 0$
  - What are these transfers anyway in rep. HH model? If were not pure rent (with heterogeneity in HH), may not have $\pi^* > 0$
- Misses important constraint: interest-rate lower bound

3. Simple rules based on IRFs: Potential Pitfalls

- Method proposed by SU
  - Compute IRFs to shocks under Ramsey plan
  - Compute IRFs to shocks under simple fiscal/monetary rules
  - Find coefficients of policy rule that minimize distance between IRFs
- Advantage: relatively easy to implement
- But how close to true optimal (simple) rule?

3. Simple rules based on IRFs: Potential Pitfalls

- Example: Simplest NK model (fiscal policy ricardian)

$$x_t = E_t x_{t+1} - \sigma^{-1}(i_t - E_t \pi_{t+1} - r_t^n)$$

$$\pi_t = \kappa x_t + \beta E_t \pi_{t+1} + u_t$$

Loss criterion: $E[L_0]$, where

$$L_0 = E_0 \left\{ (1-\beta) \sum_{t=0}^{\infty} \beta^t [\pi_t^2 + \lambda_x x_t^2 + \lambda_i i_t^2] \right\}$$

Policy rule of form of Taylor rule

$$i_t = \psi_\pi \pi_t + \psi_x x_t$$

Shocks: $r_t^n,\ u_t \sim \mathrm{AR}(1)$

- Calibration as in Woodford (2003)

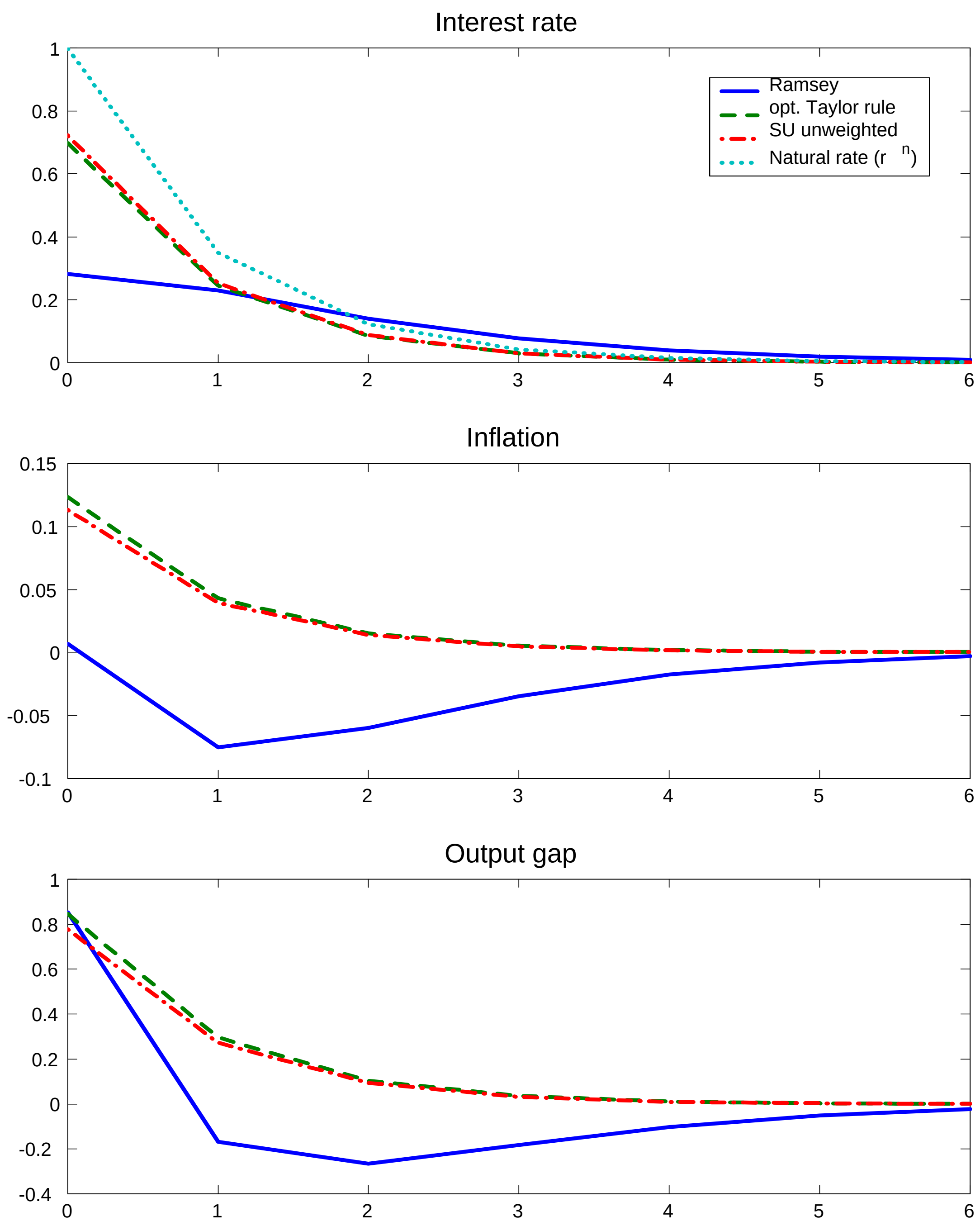
- What is optimal policy?

3. Simple rules based on IRFs: Pitfalls

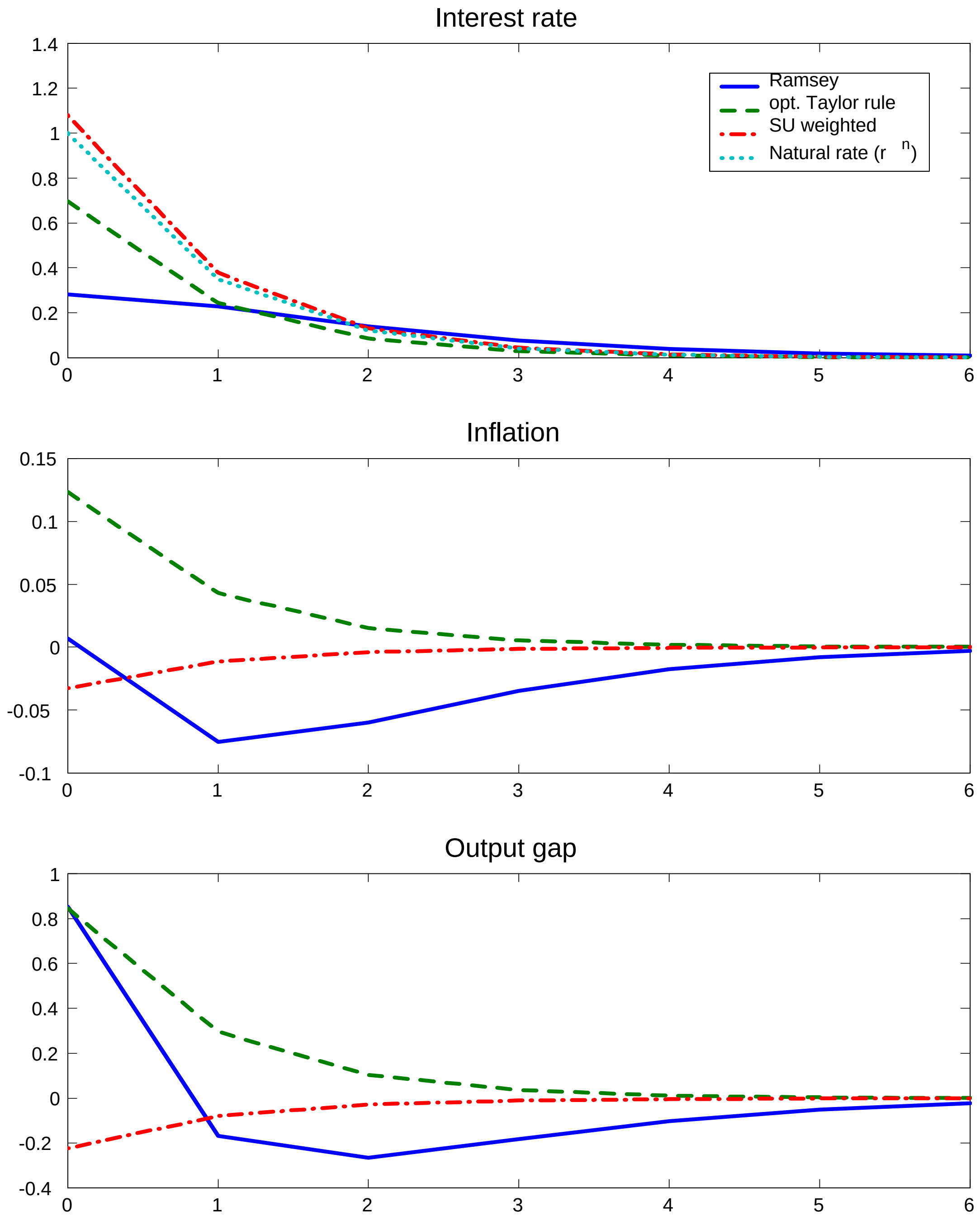
	ψ_π	ψ_x	$\mathrm{E}[L_0]$
Ramsey	–	–	1.3
True optimal simple (Taylor) rule	1.7	0.6	2.6
S-U (unweighted IRFs)	5.0	0.2	2.9
S-U (weighted IRFs: $1, \sqrt{\lambda_x}, \sqrt{\lambda_i}$)	-5.8	-4.0	4.2

- SU approach: weighting of IRFs matters a lot
  - Unweighted: policy rule different but little loss (luck!)
  - Weighted: rule very far from optimal Taylor rule
    - negative response of i to $\pi, x,$ as in SU
    - large loss

$\Rightarrow$ *SU approach does not capture true simple optimal rule*



IRFs to a shock to r^n (unweighted)



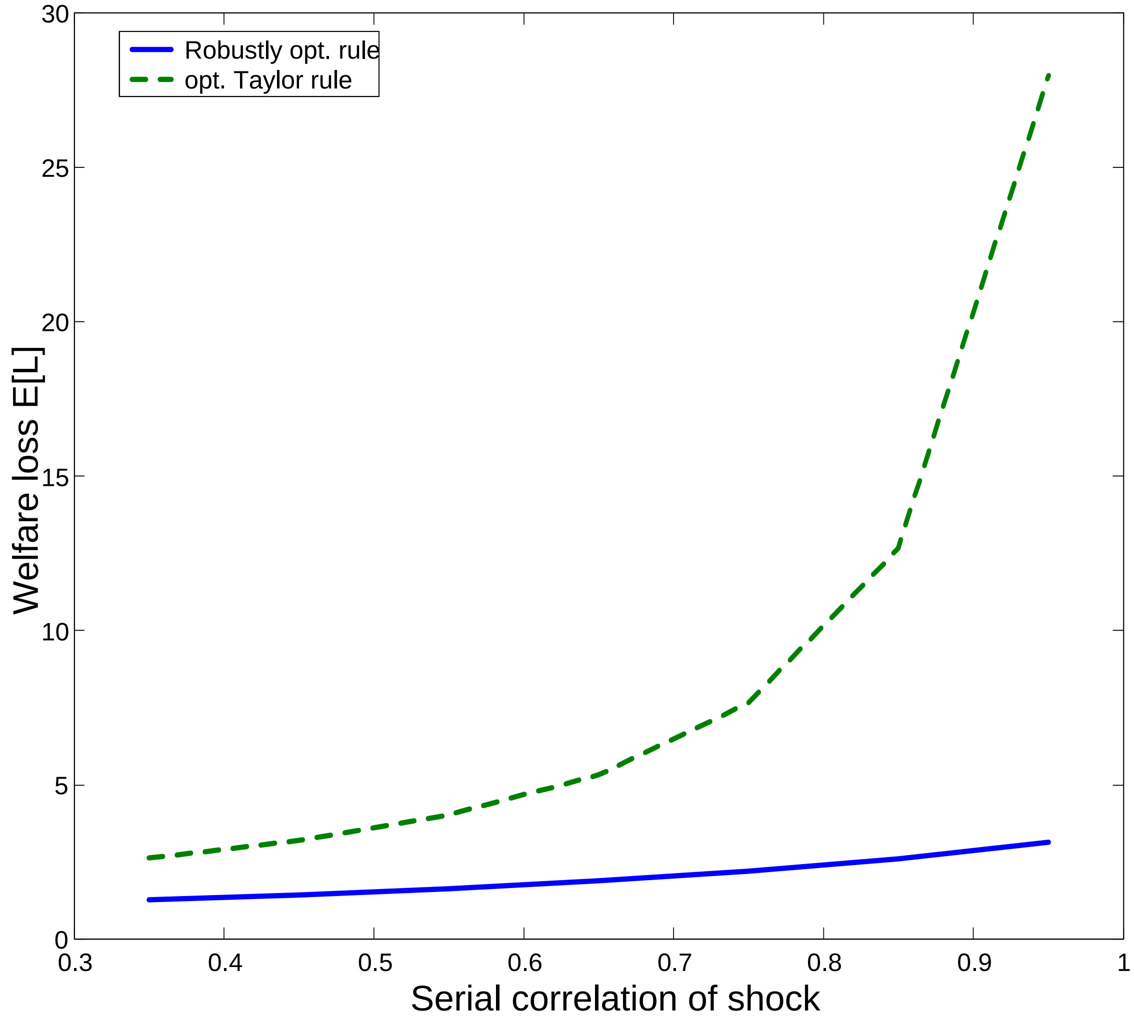
IRFs to a shock to r^n (weighted IRFs)

4. Problem of optimized simple rules

- Often perform well in context of model, for given, known and not changing shock processes

- Sensitive to shock process assumed
  - Relevant here since SU assume only 3 shocks: TFP, govt. expenditure, transfers
    – If other shocks matter (see, Smets and Wouters) simple rule may perform very badly
- NK Example: Taylor rule with $\psi_\pi = 1.7,\ \psi_x = 0.6$ optimal when $\rho = 0.35,$ but....

Welfare losses with optimized simple rule when shock processes change



A solution: Robustly optimal rule

- Derived from FOCs in Ramsey problem
- In NK example:

$$i_t = \frac{\kappa}{\lambda_i \sigma}\pi_t + \frac{\lambda_x}{\lambda_i \sigma}(x_t - x_{t-1}) + \left(1 + \frac{\kappa}{\beta\sigma} + \beta^{-1}\right) i_{t-1} - \beta^{-1} i_{t-2}$$

- Properties:
  - always yields a determinate equilibrium
  - implements optimal equilibrium
  - involves only target variables
  - invariant to shock processes (robust!)
- Can be extended to
  - very general LQ system: Giannoni-Woodford (2002)
  - monetary/fiscal policy: Benigno-Woodford (2004)

Conclusion: Schmitt-Grohe and Uribe paper

- Very nice and important paper
- Serious attempt at analyzing implications for fiscal and monetary policy of multiple frictions
- Important predictions for steady optimal inflation / tax rates
- Weaknesses:
  - Calibrated parameters not mutually consistent
  - Result $\pi^* > 0$ sensitive to peculiar assumption about transfers
  - SU approach for simple optimal rules: does not necessarily capture true optimal simple rule